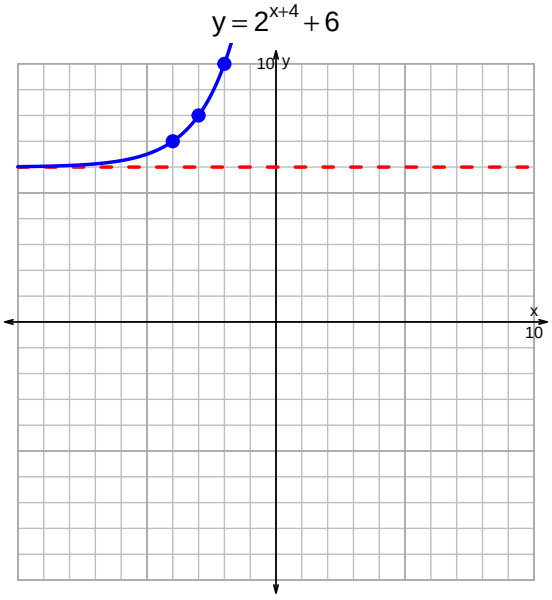
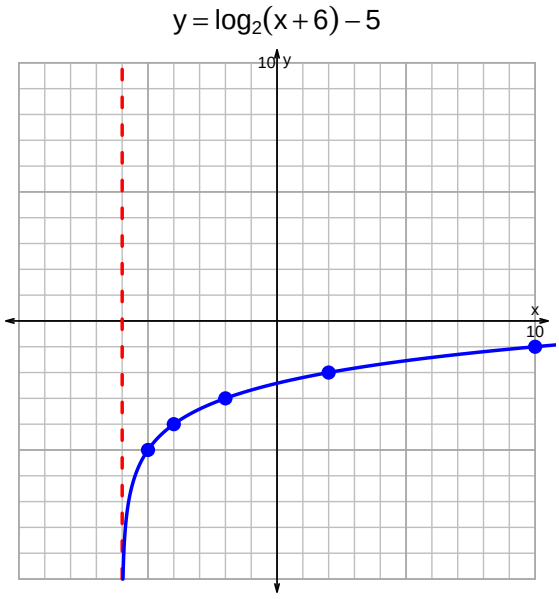
Name: Date:

s18quiz: EXP LOG (Solution v125)

1. Graph $y = 2^{x+4} + 6$ and $y = \log_2(x+6) - 5$ on the grids below. Also, draw any asymptotes with dotted lines.





2. Write (but do not evaluate) the solution to the equation below by writing a logarithmic expression.

$$-13 = \left(\frac{-3}{5}\right) \cdot 10^{-7t/4}$$

Divide both sides by $\frac{-3}{5}$.

$$\frac{13 \cdot 5}{3} = 10^{-7t/4}$$

Take log, base 10, of both sides.

$$\log_{10}\left(\frac{13 \cdot 5}{3}\right) = \frac{-7t}{4}$$

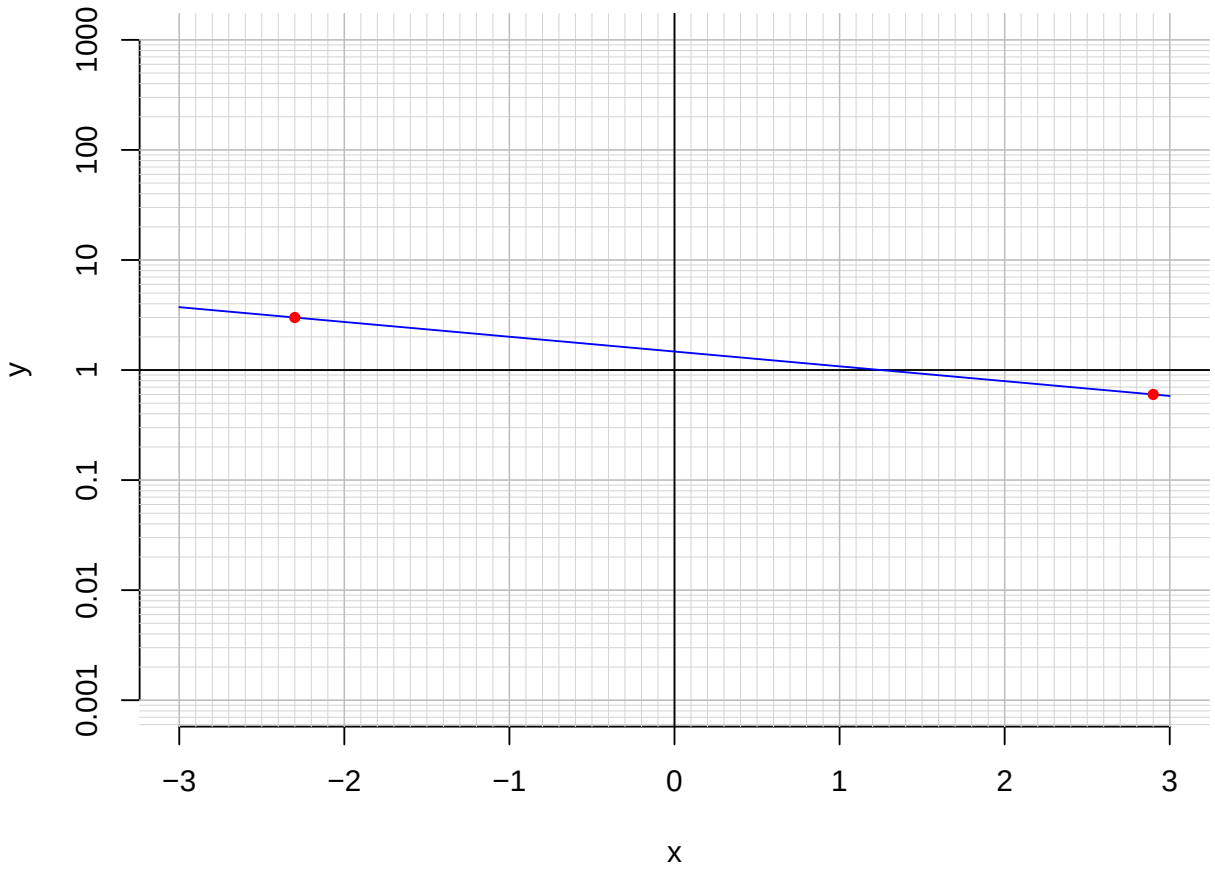
Divide both sides by $\frac{-7}{4}$.

$$\frac{-4}{7} \cdot \log_{10}\left(\frac{13 \cdot 5}{3}\right) = t$$

Switch sides.

$$t = \frac{-4}{7} \cdot \log_{10}\left(\frac{13 \cdot 5}{3}\right)$$

3. An exponential function $f(x) = 1.47 \cdot e^{-0.31x}$ is graphed below on a semi-log plot.



a. Using the plot above, evaluate $f(2.9)$.

$$f(2.9) = 0.6$$

b. Express $f^{-1}(x)$, the inverse of f.

$$f^{-1}(x) = \frac{-1}{0.31} \cdot \ln\left(\frac{x}{1.47}\right)$$

c. Using the plot above, evaluate $f^{-1}(3)$.

$$f^{-1}(3) = -2.3$$